

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-18 (cancelled)

Claim 19 (new): A method for signal processing operable to transform an input signal into an output signal comprising a Threshold Domain Filtering step performing Threshold Domain Filtering and at least one additional step operable to perform a function selected from the group consisting of Multimodal Pulse Shaping, Analog Rank Filtering, and Analog Counting.

Claim 20 (new): A method for signal processing as recited in claim 19 wherein said Threshold Domain Filtering step is operable to extract one or more features of interest from said input signal to produce one or more output signals.

Claim 21 (new): A method for signal processing as recited in claim 19 wherein a threshold domain of said Threshold Domain Filtering is defined by a Control Level Signal, said Control Level Signal consisting of one or more components.

Claim 22 (new): A method for signal processing as recited in claim 19 wherein said Threshold Domain Filtering step outputs a first output value when said input signal is within a threshold domain of said Threshold Domain Filtering and a second output value when said input signal is outside of said threshold domain.

Claim 23 (new): A method for signal processing as recited in claim 19 wherein said Threshold Domain Filtering step outputs a first output value when said input signal is within a threshold domain of said Threshold Domain Filtering, a second

output value when said input signal is outside of said threshold domain, and one or more values when said input signal is inside a finite interval at a boundary of said threshold domain.

Claim 24 (new): A method for signal processing as recited in claim 19 wherein at least one of said additional steps is operable to perform Multimodal Pulse Shaping and wherein said input signal has one or more components and wherein said Multimodal Pulse Shaping transforms at least one of said input signal components into a plurality of output signal components where at least one of said output signal components represents a derivative of another of said output signal components.

Claim 25 (new): A method for signal processing as recited in claim 24 wherein said derivative is a time-derivative.

Claim 26 (new): A method for signal processing as recited in claim 24 wherein said plurality of output signal components is representative of one or more features of interest of said input signal.

Claim 27 (new): A method for signal processing as recited in claim 19 wherein at least one of said additional steps is Analog Counting operable to perform an Analog Counting function and wherein said Threshold Domain Filtering step has an output with at least one component and where said Analog Counting comprises the steps of:

- a. time-differentiating said component to produce a time-derivative, and
- b. rectifying said time-derivative to produce an instantaneous count rate.

Claim 28 (new): A method for signal processing as recited claim 27 wherein said Analog Counting further comprises the step of time-integrating said instantaneous count rate in a moving time window to produce a count rate.

**Claim 29 (new):** A method for signal processing as recited in claim 21 wherein at least one of said additional steps is operable to perform Analog Rank Filtering and wherein said one or more components of said Control Level Signal are linear combinations of outputs of said Analog Rank Filtering.

**Claim 30 (new):** A method for signal processing as recited in claim 29 wherein said input signal has one or more components and wherein said Analog Rank Filtering is performed on one or more components of said input signal.

**Claim 31 (new):** A method for signal processing as recited in claim 21 wherein at least one of said additional steps is operable to perform Analog Rank Filtering and wherein at least one of said additional steps is operable to perform Multimodal Pulse Shaping and wherein said one or more components of said Control Level Signal are produced by applying said Analog Rank Filtering to one or more output components of said Multimodal Pulse Shaping.

**Claim 32 (new):** A method for signal processing operable to transform an input signal into an output signal comprising the steps of:

- a. forming a plurality of outputs of delayed comparators by passing said input signal and a plurality of feedbacks of Offset Rank Filtered Signals through a respective plurality of said delayed comparators, said Offset Rank Filtered Signals having Offset Quantile Parameters;
- b. forming a first difference which is a weighted difference of said outputs of the delayed comparators;
- c. forming a Density Function by time averaging said first difference;
- d. forming a second difference which is a weighted difference of said feedbacks of the Offset Rank Filtered Signals;
- e. forming a plurality of differences between the outputs of the delayed comparators and the respective Offset Quantile Parameters of said Offset Rank Filtered Signals;

- f. forming a plurality of time derivatives of said Offset Rank Filtered Signals by multiplying each of said plurality of differences by a ratio of said second difference and said Density Function;
- g. producing the plurality of said Offset Rank Filtered Signals by time-integrating said plurality of time derivatives; and
- h. producing said output signal as a weighted average of said Offset Rank Filtered Signals.

Claim 33 (new): A method for signal processing as recited in claim 32 wherein:

- a. said plurality of outputs of delayed comparators consists of two outputs and said plurality of feedbacks of Offset Rank Filtered Signals consists of two feedbacks and said plurality of said delayed comparators consists of two delayed comparators;
- b. said first difference is a difference of said two outputs of said two delayed comparators;
- c. said second difference is a difference of said two feedbacks;
- d. said plurality of differences consists of two differences;
- e. said plurality of time derivatives consists of two time derivatives;
- f. said plurality of the Offset Rank Filtered Signals consists of two Offset Rank Filtered Signals; and
- g. said weighted average of said Offset Rank Filtered Signals is an average of said two Offset Rank Filtered Signals.

Claim 34 (new): A method for signal processing operable to transform a plurality of input signals into an output signal comprising the steps of:

- a. forming a plurality of outputs of averaging comparators by passing said plurality of input signals and a plurality of feedbacks of Offset Rank Selected Signals through a plurality of said averaging comparators, said Offset Rank Selected Signals having Offset Quantile Parameters;
- b. forming a first difference which is a weighted difference of said outputs of the averaging comparators;

- c. forming a Density Function by time averaging said first difference;
- d. forming a second difference which is a weighted difference of said feedbacks of the Offset Rank Selected Signals;
- e. forming a plurality of differences between the outputs of the averaging comparators and the respective Offset Quantile Parameters of said Offset Rank Selected Signals;
- f. forming a plurality of time derivatives of said Offset Rank Selected Signals by multiplying each of said plurality of differences by a ratio of said second difference and said Density Function;
- g. producing the plurality of said Offset Rank Selected Signals by time-integrating said plurality of the time derivatives; and
- h. producing said output signal as a weighted average of said Offset Rank Selected Signals.

Claim 35 (new): A method for signal processing as recited in claim 34 wherein:

- a. said plurality of outputs of averaging comparators consists of two outputs and said plurality of feedbacks of Offset Rank Selected Signals consists of two feedbacks and said plurality of said averaging comparators consists of two averaging comparators;
- b. said first difference is a difference of said two outputs of said two averaging comparators;
- c. said second difference is a difference of said two feedbacks;
- d. said plurality of differences consists of two differences;
- e. said plurality of time derivatives consists of two time derivatives;
- f. said plurality of the Offset Rank Selected Signals consists of two Offset Rank Selected Signals; and
- g. said weighted average of said Offset Rank Selected Signals is an average of said two Offset Rank Selected Signals.

Claim 36 (new): A method for image processing operable to transform an input image signal into an output signal comprising the steps of:

- a. forming a plurality of outputs of delayed comparators by passing said input image signal and a plurality of feedbacks of Offset Rank Filtered Signals through a respective plurality of said delayed comparators, said Offset Rank Filtered Signals having Offset Quantile Parameters;
- b. forming a first difference which is a weighted difference of said outputs of the delayed comparators;
- c. forming a Density Function by time averaging said first difference;
- d. forming a second difference which is a weighted difference of said feedbacks of the Offset Rank Filtered Signals;
- e. forming a plurality of differences between the outputs of the delayed comparators and the respective Offset Quantile Parameters of said Offset Rank Filtered Signals;
- f. forming a plurality of time derivatives of said Offset Rank Filtered Signals by multiplying each of said plurality of differences by a ratio of said second difference and said Density Function;
- g. producing the plurality of said Offset Rank Filtered Signals by time-integrating said plurality of time derivatives; and
- h. producing said output signal as a weighted average of said Offset Rank Filtered Signals.

Claim 37 (new): A method for image processing as recited in claim 36 wherein:

- a. said plurality of outputs of delayed comparators consists of two outputs and said plurality of feedbacks of Offset Rank Filtered Signals consists of two feedbacks and said plurality of said delayed comparators consists of two delayed comparators;
- b. said first difference is a difference of said two outputs of said two delayed comparators;
- c. said second difference is a difference of said two feedbacks;
- d. said plurality of differences consists of two differences;
- e. said plurality of time derivatives consists of two time derivatives;

- f. said plurality of the Offset Rank Filtered Signals consists of two Offset Rank Filtered Signals; and
- g. said weighted average of said Offset Rank Filtered Signals is an average of said two Offset Rank Filtered Signals.

Claim 38 (new): A method for image processing operable to transform a plurality of input image signals into an output signal comprising the steps of:

- a. forming a plurality of outputs of averaging comparators by passing said plurality of input image signals and a plurality of feedbacks of Offset Rank Selected Signals through a plurality of said averaging comparators, said Offset Rank Selected Signals having Offset Quantile Parameters;
- b. forming a first difference which is a weighted difference of said outputs of the averaging comparators;
- c. forming a Density Function by time averaging said first difference;
- d. forming a second difference which is a weighted difference of said feedbacks of the Offset Rank Selected Signals;
- e. forming a plurality of differences between the outputs of the averaging comparators and the respective Offset Quantile Parameters of said Offset Rank Selected Signals;
- f. forming a plurality of time derivatives of said Offset Rank Selected Signals by multiplying each of said plurality of differences by a ratio of said second difference and said Density Function;
- g. producing the plurality of said Offset Rank Selected Signals by time-integrating said plurality of the time derivatives; and
- h. producing said output signal as a weighted average of said Offset Rank Selected Signals.

Claim 39 (new): A method for image processing as recited in claim 38 wherein:

- a. said plurality of outputs of averaging comparators consists of two outputs and said plurality of feedbacks of Offset Rank Selected Signals consists of

two feedbacks and said plurality of said averaging comparators consists of two averaging comparators;

- b. said first difference is a difference of said two outputs of said two averaging comparators;
- c. said second difference is a difference of said two feedbacks;
- d. said plurality of differences consists of two differences;
- e. said plurality of time derivatives consists of two time derivatives;
- f. said plurality of the Offset Rank Selected Signals consists of two Offset Rank Selected Signals; and
- g. said weighted average of said Offset Rank Selected Signals is an average of said two Offset Rank Selected Signals.

Claim 40 (new): An apparatus for signal processing operable to transform an input signal into an output signal comprising a Threshold Domain Filtering module operable to perform Threshold Domain Filtering and at least one additional module operable to perform a function selected from the group consisting of Multimodal Pulse Shaping, Analog Rank Filtering, and Analog Counting.

Claim 41 (new): An apparatus for signal processing as recited in claim 40 wherein said Threshold Domain Filtering module is operable to extract one or more features of interest from said input signal to produce one or more output signals.

Claim 42 (new): An apparatus for signal processing as recited in claim 40 wherein a threshold domain of said Threshold Domain Filtering is defined by a Control Level Signal, said Control Level Signal consisting of one or more components.

Claim 43 (new): An apparatus for signal processing as recited in claim 40 wherein said Threshold Domain Filtering module outputs a first output value when said input signal is within a threshold domain of said Threshold Domain Filtering and a second output value when said input signal is outside of said threshold domain.

Claim 44 (new): An apparatus for signal processing as recited in claim 40 wherein said Threshold Domain Filtering module outputs a first output value when said input signal is within a threshold domain of said Threshold Domain Filtering, a second output value when said input signal is outside of said threshold domain, and one or more values when said input signal is inside a finite interval at a boundary of said threshold domain.

Claim 45 (new): An apparatus for signal processing as recited in claim 40 wherein at least one of said additional modules is a Multimodal Pulse Shaping and wherein said input signal has one or more components and wherein said Multimodal Pulse Shaping transforms at least one of said input signal components into a plurality of output signal components where at least one of said output signal components represents a derivative of another of said output signal components.

Claim 46 (new): An apparatus for signal processing as recited in claim 45 wherein said derivative is a time-derivative.

Claim 47 (new): An apparatus for signal processing as recited in claim 45 wherein said plurality of output signal components is representative of one or more features of interest of said input signal.

Claim 48 (new): An apparatus for signal processing as recited in claim 40 wherein at least one of said additional modules is an Analog Counting module operable to perform an Analog Counting function and wherein said Threshold Domain Filtering module has an output with at least one component and where said Analog Counting module comprises:

- a. a differentiator operable to time-differentiate said component to produce a time-derivative, and
- b. a rectifier operable to rectify said time-derivative to produce an instantaneous count rate.

Claim 49 (new): An apparatus for signal processing as recited claim 48 wherein said Analog Counting module further comprises an integrator operable to time-integrate said instantaneous count rate in a moving time window to produce a count rate.

Claim 50 (new): An apparatus for signal processing as recited in claim 42 wherein at least one of said additional modules is operable to perform Analog Rank Filtering and wherein said one or more components of said Control Level Signal are linear combinations of outputs of said Analog Rank Filtering.

Claim 51 (new): An apparatus for signal processing as recited in claim 50 wherein said input signal has one or more components and wherein said Analog Rank Filtering is performed on one or more components of said input signal.

Claim 52 (new): An apparatus for signal processing as recited in claim 42 wherein at least one of said additional modules is operable to perform Analog Rank Filtering and wherein at least one of said additional modules is operable to perform Multimodal Pulse Shaping and wherein said one or more components of said Control Level Signal are produced by applying said Analog Rank Filtering to one or more output components of said Multimodal Pulse Shaping.

Claim 53 (new): An apparatus for signal processing operable to transform an input signal into an output signal comprising:

- a. a plurality of delayed comparators operable to form a plurality of outputs by passing said input signal and a plurality of feedbacks of Offset Rank Filtered Signals through said plurality of delayed comparators, said Offset Rank Filtered Signals having Offset Quantile Parameters;
- b. a component operable to form a first difference which is a weighted difference of said outputs of said plurality of delayed comparators;

- c. a component operable to form a Density Function by time averaging said first difference;
- d. a component operable to form a second difference which is a weighted difference of said feedbacks of the Offset Rank Filtered Signals;
- e. a component operable to form a plurality of differences between the outputs of said plurality of delayed comparators and the respective Offset Quantile Parameters of said Offset Rank Filtered Signals;
- f. a component operable to form a plurality of time derivatives of said Offset Rank Filtered Signals by multiplying each of said plurality of differences by a ratio of said second difference and said Density Function;
- g. a component operable to produce the plurality of said Offset Rank Filtered Signals by time-integrating said plurality of time derivatives; and
- h. a component operable to produce said output signal as a weighted average of said Offset Rank Filtered Signals.

Claim 54 (new): An apparatus for signal processing as recited in claim 53 wherein:

- a. said plurality of delayed comparators consists of two delayed comparators and said plurality of outputs consists of two outputs and said plurality of feedbacks of Offset Rank Filtered Signals consists of two feedbacks;
- b. said first difference is a difference of said two outputs of said two delayed comparators;
- c. said second difference is a difference of said two feedbacks;
- d. said plurality of differences consists of two differences;
- e. said plurality of time derivatives consists of two time derivatives;
- f. said plurality of the Offset Rank Filtered Signals consists of two Offset Rank Filtered Signals; and
- g. said weighted average of said Offset Rank Filtered Signals is an average of said two Offset Rank Filtered Signals.

Claim 55 (new): An apparatus for signal processing operable to transform a plurality of input signals into an output signal comprising:

- a. a plurality of averaging comparators operable to form a plurality of outputs by passing said plurality of input signals and a plurality of feedbacks of Offset Rank Selected Signals through said plurality of averaging comparators, said Offset Rank Selected Signals having Offset Quantile Parameters;
- b. a component operable to form a first difference which is a weighted difference of said outputs of the averaging comparators;
- c. a component operable to form a Density Function by time averaging said first difference;
- d. a component operable to form a second difference which is a weighted difference of said feedbacks of the Offset Rank Selected Signals;
- e. a component operable to form a plurality of differences between the outputs of said plurality of averaging comparators and the respective Offset Quantile Parameters of said Offset Rank Selected Signals;
- f. a component operable to form a plurality of time derivatives of said Offset Rank Selected Signals by multiplying each of said plurality of differences by a ratio of said second difference and said Density Function;
- g. a component operable to produce the plurality of said Offset Rank Selected Signals by time-integrating said plurality of the time derivatives;  
and
- h. a component operable to produce said output signal as a weighted average of said Offset Rank Selected Signals.

Claim 56 (new): An apparatus for signal processing as recited in claim 55 wherein:

- a. said plurality of said averaging comparators consists of two averaging comparators and said plurality of outputs consists of two outputs and said plurality of feedbacks of Offset Rank Selected Signals consists of two feedbacks;
- b. said first difference is a difference of said two outputs of said two averaging comparators;
- c. said second difference is a difference of said two feedbacks;